

REMARKS

Claims 1-17, 18-23, and 25-27 are pending in this application and have been rejected. Support for the amendments to the claims proposed above can be found in paragraph [0033] and [0035] of the original specification, as well as the original claims.

Paragraph [0033] of the specification (and corresponding amendments in the claims) have also been amended because the undersigned has been informed that the word “bonded” was mistranslated from the expressions “contacted” or “supported” in the original Korean patent application. New matter has not been entered by the amendment since the term “contacted” was also used in paragraph [0014] of the original specification and original claim 1. Thus, the amendment to the specification also makes the disclosure of the specification more consistent.

Claim Rejection: 35 USC § 112

Claim 14 has been rejected under 35 USC § 112, ¶2, as being indefinite for the reasons set forth on page 2 of the Office Action. Applicant respectfully traverses this rejection.

The Office argues that claim 14 is indefinite since the specification discloses that the ceramic layer is bonded to the leadframe either by the molding material or by the solder adhesive. Such an argument is not consistent with the teachings of the present specification. Accordingly, the Office has not shown that the skilled artisan would have not understood the metes and bounds of claim 14, especially when considered in light of the specification.

By way of explanation, Figure 6 and paragraph [0033] of the original specification describe that the ceramic layer is bonded to the leadframe “without an adhesive.” *See lines 3-4.*¹ For the reasons mentioned above, the word “bonded” should have been translated to mean “contacted.” In other words, the ceramic layer and the leadframe contact each other because of the encapsulation action of the molding material 450. *See lines 5-6.* It is important to note that the molding material 450 is not present between the ceramic layer and the leadframe; rather, the molding material encapsulates and surrounds the ceramic layer and the leadframe. *See Figure 6.* It is this encapsulation action that contacts the ceramic layer and the leadframe, and not any adhesive, since the molding material forces these two elements together.

It is noted that the ceramic layer and the leadframe can be attached to each other using an epoxy material. This configuration of the device is described in paragraphs [0015] and [0035] of the original specification and illustrated in Figure 7. When the epoxy material is used, the ceramic layer does not directly contact the leadframe because the epoxy material is present between the two.

With this technical information, Applicant respectfully disagrees that present claim 14 is indefinite. Claim 14 recites that the ceramic layer contacts the second surface of the lead frame without using an adhesive. Such a limitation is consistent with the specification, especially original paragraph [0015], present paragraph [0033], and Figure 6 which describes that the molding material—and not the adhesive—is the force contacting these two components of the device. Thus, the skilled artisan would have understood the subject matter of claim 14 has been

¹ Applicant notes that a solder adhesive can be used between the chip and the leadframe.

set forth with a reasonable degree of particularity and distinctness in light of the specification.
See M.P.E.P. § 2173.02.

Accordingly, the Office has not substantiated that claim 14 is indefinite and, therefore, Applicant respectfully requests withdrawal of this ground of rejection.

Claim Rejection: 35 USC § 102 over Takahashi et al.

The Office has rejected claims 1, 3, 5, 25, and 27 under 35 USC § 102(b) as being anticipated by Takahashi et al. (U.S. Patent No. 5,783,466) for the reasons noted on pages 2-4 and 12 of the Office Action. Applicant respectfully traverses this rejection.

Pointing to Figure 1 and its accompanying description, the Office argues that Takahashi et al. teach every limitation in the claims. Applicant respectfully disagrees for the reasons previously argued: namely, that the Office has not substantiated that Takahashi et al. describes a ceramic layer that contacts the lead frame. In response to such arguments, the Office interpreted the rejected claims to mean that the ceramic layer is attached to the leadframe using the molding material. Based on such an interpretation, the Office alleges that there is no structural difference between the rejected claims and the device of Takahashi et al., even though that device contains an alloy layer between the ceramic layer and the leadframe.

In light of the information presented above with respect to the indefiniteness rejection, Applicant believes the Office has misinterpreted the claims with regard to how the molding material attaches the ceramic layer to the leadframe. As discussed above, the ceramic layer contacts the leadframe by the action of the molding material, not because there is a molding material present between these two components (which appears to be how the Office has

interpreted the claims). Thus, there is a distinct structural difference between the device of Takahashi et al. and the claims: the device in Takahashi contains an alloy layer between the ceramic layer and the leadframe. Therefore, these two components cannot contact each other as recited in the present claims.

Further, claim 1 currently recites that the lead frame pad contacts the ceramic layer by using only the molding material. But the Office has not argued—much less alleged—that Takahashi et al. describe such a feature in the device of Figure 1.

Thus, the Office has not shown that Takahashi et al. teach every limitation recited in the rejected claims. Accordingly, Applicant respectfully requests withdrawal of this ground of rejection.

Claim Rejection: 35 USC § 102 over Wakefield et al.

The Office has rejected claims 11-12 and 20-23 under 35 USC § 102(b) as being anticipated by Wakefield et al. (U.S. Patent No. 5,598,034) for the reasons noted on pages 4-5 and 13. Applicant respectfully traverses this rejection.

Based on Figure 1 and its accompanying description, the Office argues that Wakefield et al. teach every limitation in the claims. Applicant respectfully disagrees for the reasons of record.

The rejected claims contain the limitation that a ceramic layer contacts the lead frame (and in some claims, without using an adhesive) or that the ceramic layer contacts the lead frame by using the molding material.

But the Office has not substantiated that the device of Figure 1 of Wakefield et al. describes either of these limitations. As noted by the Office, Wakefield et al. describe a semiconductor device containing a die pad paddle 11 and a heat sink 10 with an upper surface 10a. But as described by Wakefield et al., the heat sink 10 is connected to the die pad 11 using an adhesive 12 or the like. The adhesive can be any suitable conductive or non-conductive adhesive. *See column 4, lines 5-15.* Thus, the skilled artisan would have understood that the device of Wakefield et al. uses an adhesive to attach the heat sink 10 and the die pad 11. And with an adhesive present between these two components, they cannot contact each other because of the presence of the adhesive layer 12.

Thus, the Office has not shown that Wakefield et al. describes every limitation recited in the rejected claims. Accordingly, Applicant requests withdrawal of this ground of rejection.

Claim Rejection: 35 USC § 103: Takahashi et al. & Wakefield et al.

The Office has rejected claim 2 as being unpatentable over Takahashi et al. in view of Wakefield et al. for the reasons noted on pages 5-6. Applicant respectfully traverses this rejection.

The Office has not substantiated that the device in Figure 1 of Takahashi et al. or the device in Figure 1 of Wakefield et al. teaches or suggests the claim limitation that the ceramic layer directly contacts the leadframe or that the ceramic layer contacts the lead frame by using the molding material. As noted above, the device in Figure 1 of Takahashi et al. contains an alloy layer between the ceramic layer and the leadframe and the device in Figure 1 of Wakefield contains an adhesive between these two components. And since neither reference individually

teaches or suggests these limitations, the combination of these references can therefore not suggest them.

Thus, the Office has not shown that the combination of the cited references suggests every limitation recited in the rejected claims. Accordingly, Applicant requests withdrawal of this ground of rejection.

Claim Rejection: 35 USC § 103: Takahashi et al. & Nakanishi et al.

The Office has rejected claim 4 as being unpatentable over Takahashi et al. in view of Nakanishi et al. (U.S. Patent No. 6,501,156) for the reasons noted on page 6. Applicant respectfully traverses this rejection.

As noted above, the Office has not substantiated that the device in Figure 1 of Takahashi et al. teaches or suggests the claim limitation that the ceramic layer contacts the lead frame or that the ceramic layer contacts the lead frame by using the molding material. And the Office has not even argued that Nakanishi et al. teaches or suggests such a limitation. And where the Office has not argued or substantiated that each reference individually teaches or suggests these limitations, the Office can not substantiate that the combination of these references suggests either of these limitations, not to mention both of them.

Thus, the Office has not shown that the combination of the cited references suggests every limitation recited in the rejected claims. Accordingly, Applicant requests withdrawal of this ground of rejection.

Claim Rejection: 35 USC § 103: Wakefield et al. & Heinen et al.

The Office has rejected claims 6-8, 13-17, 19, and 26 as being unpatentable over Wakefield et al. in view of Heinen et al. (U.S. Patent No. 5,422,788) for the reasons noted on pages 7-11. Applicant respectfully traverses this rejection.

As noted above, the Office has not substantiated that the device in Figure 1 of Wakefield et al. teaches or suggests the limitation that the ceramic layer contacts the lead frame using the molding material or that the ceramic layer contacts the lead frame by using the molding material. Rather, the device in Figure 1 of Takahashi et al. contains an adhesive between the ceramic layer and the leadframe. And the Office has not even argued that the skilled artisan would have considered such a limitation taught or suggested by the disclosure of Heinen et al. Indeed, the Office previously admitted that the device in Figure 1 of Heinen et al. fails to teach that a ceramic layer contacts the second surface of the lead frame. And where the Office has not argued or substantiated that each reference individually teaches or suggests these limitations, the Office can not substantiate that the combination of these references suggests either of these limitations, not to mention both of them.

Thus, the Office has not shown that the combination of the cited references suggests every limitation recited in the rejected claims. Accordingly, Applicant requests withdrawal of this ground of rejection.

Claim Rejection: 35 USC § 103 over Wakefield et al., Heinen et al., & Nakanishi

The Office has rejected claim 9 as being unpatentable under 35 U.S.C. § 103 over Wakefield et al. and Heinen et al., and further in view of Nakanishi for the reasons noted on pages 10-11. Applicant respectfully traverses this rejection.

As noted above, the Office has not substantiated that either Wakefield et al. or Heinen et al. teach or suggest the limitation that the ceramic layer contacts the lead frame or that they contact each other using only the molding material. Neither has the Office shown—much less even alleged—that the skilled artisan would have considered such a limitation taught or suggested by the disclosure of Nakanishi et al. And where the Office has not argued or substantiated that each reference individually teaches or suggests these limitations, the Office can not substantiate that the combination of these references suggests either, much less both, of these claim limitations.


Thus, the Office has not shown that the combination of the cited references suggests every limitation recited in the rejected claims. Accordingly, Applicant requests withdrawal of this ground of rejection.

CONCLUSION

For the above reasons, as well as the numerous reasons of record, Applicant respectfully requests the Office to withdraw the pending grounds of rejection and allow the pending claims.

If there is any fee due in connection with the filing of this Amendment, including a fee for any extension of time not accounted for above, please charge the fee to our Deposit Account No. 50-0843.

Respectfully Submitted,

By 

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